

MITES OF THE FAMILY PACHYGNATHIDAE  
(ACARI: ENDEOSTIGMATA) FROM TEXAS

B. MCDANIEL AND ERIC G. BOLEN

(BM) Plant Science Department (Entomology), South Dakota State University, Brookings, South Dakota 57007; (EGB) Department of Range and Wildlife Management and Dean's Office, The Graduate School, Texas Tech University, Lubbock, Texas 79409.

---

*Abstract.*—Three new taxa of Pachygnathidae were collected during an investigation of the microarthropod fauna of the Southern High Plains and Gulf Coastal Region of Texas, *Petralycus celtisacinus*, n. sp., *P. caryapecaus*, n. sp., and *Bimichaelia dimixsetosa texana*, n. subsp. All three are described here. The two new species represent the first records of *Petralycus* from the Western Hemisphere.

---

During an investigation of the microarthropod fauna of the Southern High Plains and Gulf Coastal regions of Texas, members of the family Pachygnathidae were collected; these included two new species of the genus *Petralycus* Grandjean (1943) and a new subspecies of *Bimichaelia dimixsetosa* McDaniel (1979).

***Petralycus* Grandjean**

The genus *Petralycus* was, until the work of Theron (1977), known only from the nominal species *P. unicornis* Grandjean from France. Theron (1977) added two new species from South Africa, *P. longicornis* Theron and *P. brevicornis* Theron. In this paper two new species of *Petralycus* are described, extending the known distribution of the genus to include the United States. Setal nomenclature is after Theron (1977).

***Petralycus celtisacinus* McDaniel and Bolen, NEW SPECIES**

Figs. 1, 2

*Description.*—Dimensions: Length of body 246  $\mu$ m; breadth of body 94  $\mu$ m.

*Dorsum* (Fig. 1): Palp 5-segmented, palptarsus with 7 plumose setae, 1 thickened solenidion, 2 slender terminal solenidia; palpal segment 4-2 with 2 plumose setae; segment 3 with a single plumose seta. Gnathosoma with both movable and fixed digits provided with denticles. Hypognathum provided with 3 small branched setae, peglike adoral setae not observed. Ectomalae well developed, elongate not thickened at terminal apex. Naso very long, longer than naso of *P. longicornis*, reaching to apex of propodosoma (Fig. 1). Propodosoma with 3 pairs of setae, *ro*, *xa*, and *in*, these plumose with *in* larger than *xa* and *ro*. Sensilla *le* globose, located above sensilla *bo* and below seta *xa*. Sensilla *bo* filamentous and finely ciliate. Apodomes of propodosoma similar to those found on *P. unicornis* Grandjean. Podosoma (excluding propodosomal region) and opisthosoma with 24 plumose setae. Setae

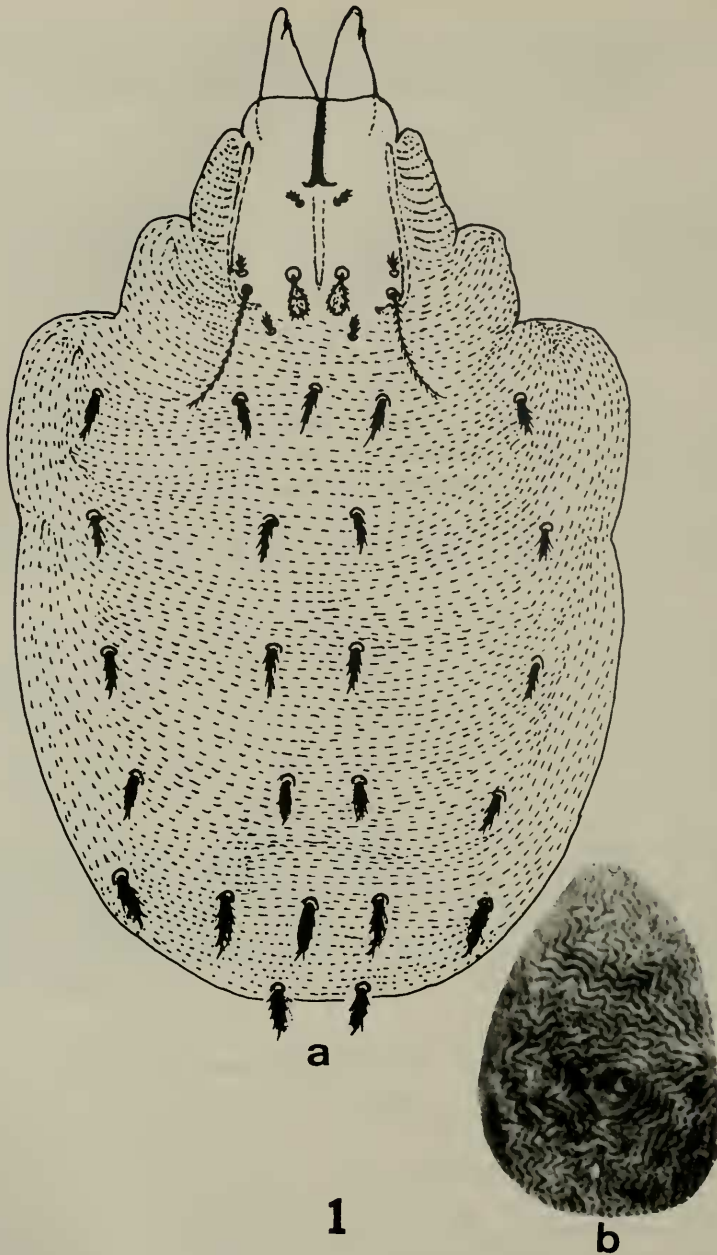


Fig. 1. *Petralycus celtisacinus*. a, Dorsal region of holotype. b, Photograph showing parallel winding ridges.

on posterior portion of hysterosoma larger than other dorsal setae. Integument of dorsum similar to other members of *Petralycus* and with numerous parallel winding ridges. Crests of ridges bear transverse lamellae.

*Venter* (Fig. 2): Genital plate with variable number of setae, with 16 plumose

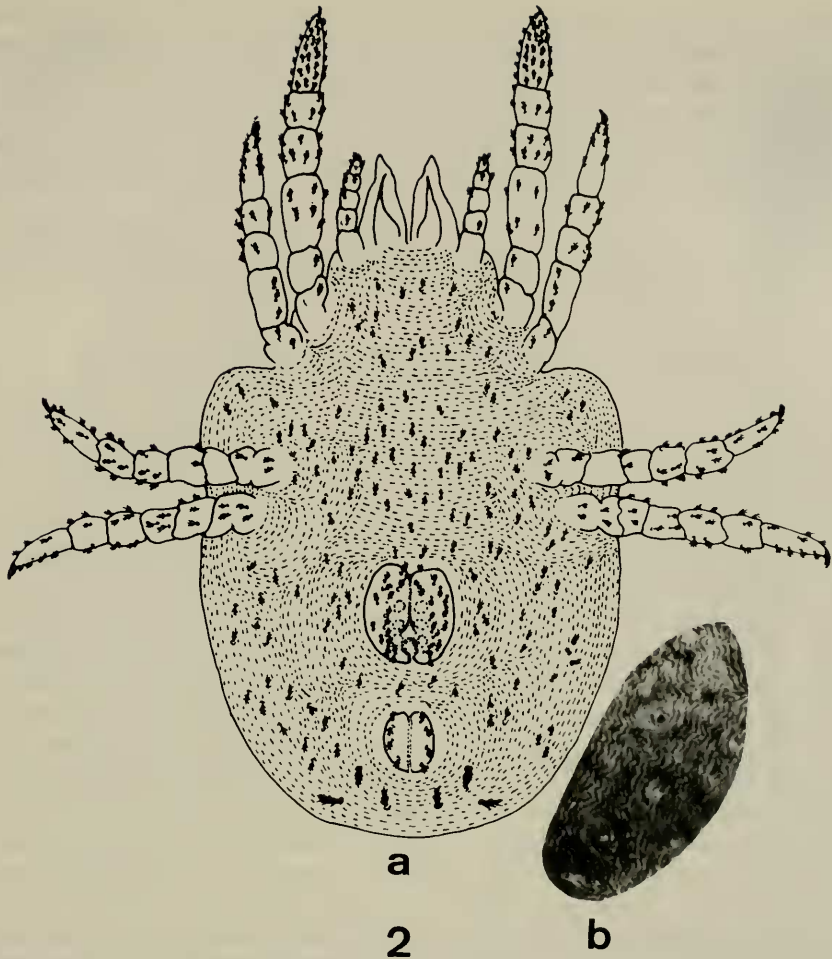


Fig. 2. *Petralycus celtisacinus*. a, Ventral region of holotype. b, Photograph showing parallel winding ridges.

setae on right  $\frac{1}{2}$ , 8 in outer row and 8 in inner row; left  $\frac{1}{2}$  with 6 in outer row, 6 in inner row; 3 pairs of oval papillae. Anal plate bears 4 pairs of plumose setae, posterior pairs largest and anterior pairs smallest. Ventral setae similar to anal plate setae and vary in size and shape. Anal region apex with 2 pairs of large plumose setae similar to posterior dorsal setae.

*Legs*: First pair of legs longer and thicker than legs II–IV. Ambulacrum with small apotele, 2 well-developed claws, and rayed empodium. Chaetotaxy of legs I–IV: tarsi (5-4-10-8-9); tibiae (10-6-6-5); genua (9-4-4-4); femora (8-5-3-5); trochanters (1-1-2-2); coxae (3-2-2-2). Solenidotaxy: Tarsi (1-1-0-0); tibiae (2-2-2-2); genua (5-2-2-2); femora (5-1-1-2).

*Holotype*.—♀ collected in San Patricio County on the Rob and Bessie Welder Wildlife Refuge, 8 mi N Sinton, Texas, May 22, 1978, by Eric G. Bolen and B. McDaniel. The holotype will be deposited with National Museum of Natural History, Washington, D.C.

Habitat.—The site is known locally as Hackberry Motte, a riparian woodland bordering the Aransas River. Soils are loams of the Sinton series, but irregular incursions of fine sands within the motte reflect periodic flooding of the site. The vegetation is a complex of herbaceous growth with a mixed overstory of hackberry (*Celtis laevigata*), anacua (*Ehretia anacua*), elm (*Ulmus crassifolia*), or pecan (*Carya illinoensis*). Mustang grape (*Vitis mustangensis*) conspicuously drapes many of the trees.

Remarks.—*Petralycus celtisacinus* resembles *P. unicornis* but differs in the length of the naso, which reaches the apex of the propodosoma, and in the numbers of solenidia on tibia I and femora I–IV.

***Petralycus caryapectaus* McDaniel and Bolen NEW SPECIES**

Figs. 3, 4

Description.—Dimensions: Length of body 222 mm; breadth of body 88 mm.

*Dorsum* (Fig. 3): Palp 5-segmented, palptarsus with 7 plumose setae; 1 large solenidion and 2 slender terminal solenidia. Gnathosoma with fixed digit provided with denticles at outer apex, movable digit appears bladelike. Hypognathum provided with 3 branched setae. Ectomalae slender with broad base and narrowing apex. Naso shorter than *P. celtisacinus* about same length of *P. longicornis*, not reaching apex of propodosoma (Fig. 3). Propodosoma with 3 pairs of setae, *ro*, *xa*, and *in*, these plumose all about equal in size. Sensilla *le* globose, appearing smooth and without small ciliated hairs found on other members of *Petralycus*. Sensilla *bo* are filamentous and finely ciliate. Apodomes of propodosoma not as well developed as in *P. unicornis* or *P. celtisacinus* but more developed than *P. longicornis* or *P. brevicornis* (Fig. 3). Podosoma (excluding propodosomal region) and opistherosoma with 32 plumose setae, all similar in shape, opistherosomal setae of last 3 rows slightly larger than other dorsal setae. Integument of dorsum has typical parallel winding ridges with setae surrounded by unstriated areas.

*Venter* (Fig. 4): Genital plate with 12 plumose setae, 4 in outer row, 8 in inner row. Internal region with 2 small densely plumose setae and 3 pairs of oval papillae. Anal plates with 4 setae each. Ventral region with integument striated similar to dorsum. Ventral setae all similar in size and shape. Gnathosomal base without typical ventral striation, with 3 pairs of large branched setae.

*Legs*: First pair of legs longer and thicker than legs II–IV. Ambulacrum with small apotele, 2 well-developed claws, and rayed empodium. Chaetotaxy of legs I–IV: Tarsi (38-12-10-12); tibiae (8-6-4-5); genua (8-4-4-3), femora (7-6-2-6); trochanters (1-0-2-2); coxae (2-2-3-4). Solenidotaxy: Tarsi (4-1-0-0); tibiae (3-2-1-1); genua (6-2-1-2); femora (3-3-0-0). Two types of setae present on tarsi of 1st pair of legs. One large solenidion accompanied by 10 normal branched setae, 5 in 2 rows with solenidion in center. Ventral portion of tarsi with 18 setae much thicker ciliated and bunched near anterior portion of tarsi, accompanied by 10 normal branched setae along lateral margins and in center of posterior portion of tarsi I.

Holotype.—♀ collected in San Patricio County on the Rob and Bessie Welder Wildlife Refuge, 8 mi N Sinton, Texas, May 6, 1978, by Eric G. Bolen and B. McDaniel. The holotype will be deposited in the National Museum of Natural History, Washington, D.C.

Habitat.—The site is known locally as Pecan Motte, a riparian woodland bor-

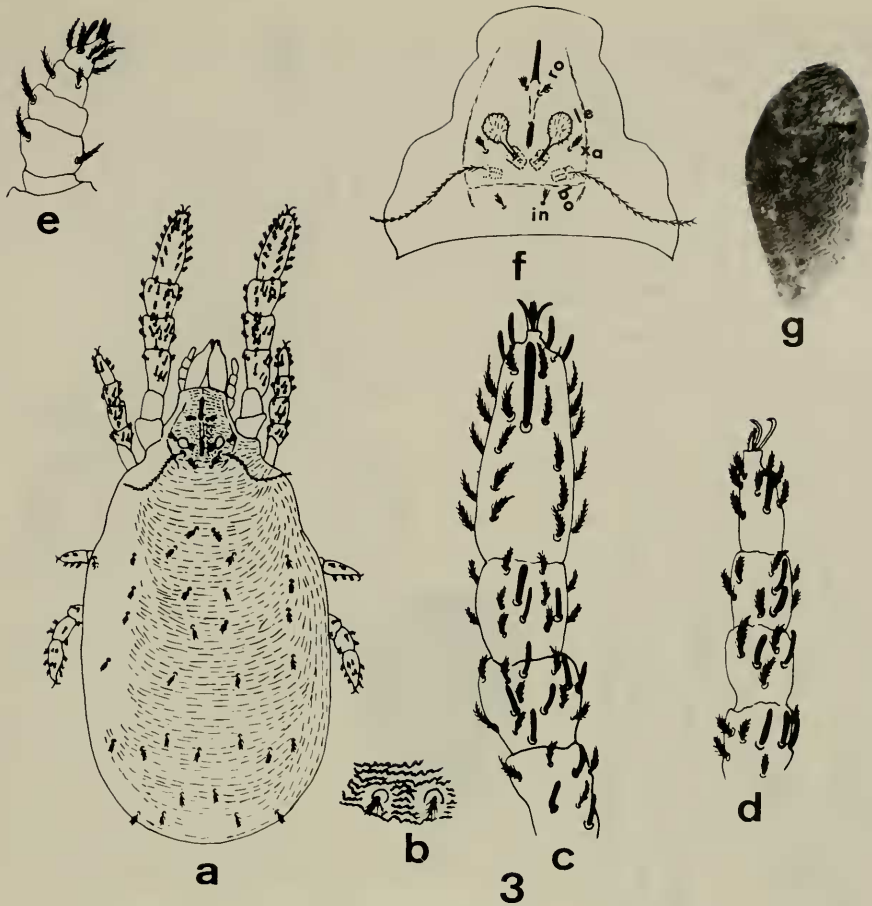


Fig. 3. *Petralycus caryapecaus*. a, Dorsal region of holotype. b, Arrangement of striae. c, Leg I showing solenidia. d, Leg II showing solenidia. e, Enlargement of palpus. f, Enlargement of propodosma showing naso, sensilla *le* and *bo*, setae *ro*, *xa*, and *in*. g, Photograph showing parallel winding ridges.

dering the Aransas River. Features of this habitat are virtually identical with those described earlier for Hackberry Motte.

Remarks.—*Petralycus caryapecaus* resembles *P. longicornis* in the length of the naso which is longer than either *P. unicornis* and *P. brevicornis*. *Petralycus caryapecaus* can be distinguished from *P. celtisacinus* by the naso not reaching the apex of the propodosma and from *P. longicornis* by development of the propodosomal apodemes and the number of solenidia on tarsus I, tibiae I and III, genua I and III, and femora I and II.

### *Bimichaelia* Thor

The genus *Bimichaelia* was first reported from the United States by Banks (1915) for *Michaelia pallida* Ewing (1913), which was placed in the genus *Bimichaelia*. *Bimichaelia pallida* (Ewing) was collected from moss in Oregon. McDaniel (1979) described two new species, *B. disetosa* McDaniel and *B. di-*

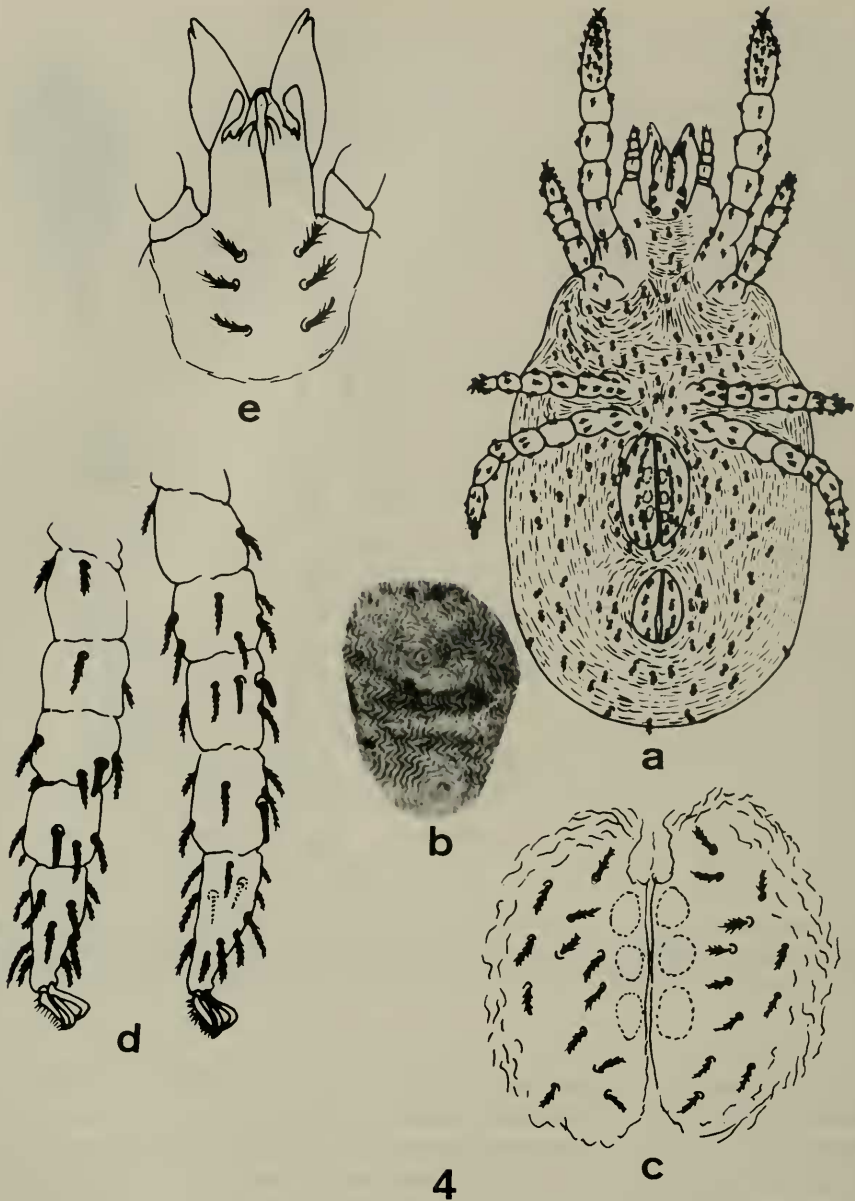


Fig. 4. *Petralycus caryapecaus*. a, Ventral region of holotype. b, Photograph showing parallel winding ridges. c, Enlargement of genital region showing setae and papillae. d, Legs III and IV showing setae. e, Hypognathum showing setae.

*mixsetosa* McDaniel from South Dakota. Specimens collected from the southern High Plains of Texas constitute a new subspecies of *B. dimixsetosa* McDaniel.

***Bimichaelia dimixsetosa texana* McDaniel and Bolen, NEW SUBSPECIES**

Diagnosis.—Similar to *B. dimixsetosa dimixsetosa* McDaniel but without enlarged setae on dorsum.

**Holotype.**—Adult ♀ collected 7.5 mi N Paduach, Rt 83, Cottle County, Texas, by Eric G. Bolen and B. McDaniel, May 30, 1980. The holotype will be deposited in the National Museum of Natural History, Washington, D.C.

**Paratypes.**—Collected from the following locations in Texas: Cottle Co., 7.5 mi N Paducah, Rt. 83, May 30, 1980, 1 deutonymph, 10 adults; Swisher Co., railroad right-of-way, FM 1981 and U.S. 87, July 22, 1979, 7 adults; Wheeler Co., 10 mi N Shamrock, Texas 83 Junction FM 1906, August 17, 1978, 1 adult; Lamb Co., 2 mi N Olton, along FM 168, 10 adults; Motley Co., 8.2 mi E Floyd-Motley Co. line U.S. 62, October 14, 1979, 9 adults, 1 deutonymph, 2 tritonymphs; Refugio Co., 1 mi S Woodsboro, November 14, 1977, 2 deutonymphs; Aransas Co., ¼ mi S. Texas 35 and FM 774, January 4, 1977, 3 adults; San Patricio Co., 7 mi N Sinton, Rob and Bessie Welder Wildlife Refuge, February 13, 1978, 1 adult; March 29, 1978, 5 adults; April 19, 1978, 1 adult; June 15, 1978, 1 adult; July 18, 1977, 2 adults.

**Habitat.**—The holotype was collected in loamy fine sands of the Miles series. These are brown, neutral soils with high available water capacity. Because Miles loamy fine sands are subjected to severe wind erosion, they are better suited for forage production than for cultivation. Wind-blown accumulations of 3 to 6 feet are common along fence rows bordering cultivated fields. Cover vegetation at the collection site consisted of sand shinnery oak (*Quercus havardii*), a dominant species covering most of the uncultivated sandy soils in Cottle County. A moderate amount of herbaceous vegetation within the oak community is grazed by cattle.

**Remarks.**—This subspecies is established to denote the more southern form of *B. dimixetosa* where more than 90% of the individuals collected from Texas are devoid of the dorsal enlarged setae. In the north, the dominant individuals possess enlarged setae on the dorsum and represent about 98% of the individuals studied. All other main diagnostic characters, such as the structure of the genitalia, type of sensilla (*ba*) and dorsal ornamentation, are constant.

#### ACKNOWLEDGMENTS

We appreciate the support of Organized Research from the College of Agricultural Sciences, Texas Tech University. Approved for publication by the Director, Agricultural Experiment Station, South Dakota State University, Brookings, as Journal Series No. 1884.

#### LITERATURE CITED

- Banks, N. 1915. The Acarina or Mites. U.S. Dep. Agric. Rep. 108: 1–153.  
Grandjean, F. 1943. Quelques genres d'Acariens appartenant au groupe des Endeostigmata (2<sup>e</sup> serie) Deux. Par. Anns. Sci. Nat. Zool. 11(5): 1–59.  
Ewing, H. E. 1913. Some New and Curious Acarina from Oregon. J. Ent. Zool. 5: 123–136.  
McDaniel, B. 1979. New Species of the Genus *Bimichaelia* Thor (Acari: Endeostigmata) from South Dakota. Acarologia 21(2): 177–186.  
Theron, P. D. 1977. New Species of the Genus *Petralycus* Grandjean (Acari: Endeostigmata) from South Africa. Acarologia 19(1): 38–45.